WHAT IS CLAIMED IS:

1. A liquid phase growth method for a silicon crystal, in which a silicon crystal is grown on a substrate by immersing the substrate in a solvent or allowing the substrate to contact the solvent, comprising the step of:

supplying a gas containing a raw material and/or a dopant to the solvent after at least a part of the gas is decomposed by application of energy to the gas.

2. The liquid phase growth method for a silicon crystal according to Claim 1, wherein the energy is applied by at least one selected from the group consisting of heat, plasma, a catalyst and light.

3. The liquid phase growth method for a silicon crystal according to Claim 1, wherein the solvent and the raw material and/or the dopant are agitated with at least one of the gas containing the raw material and/or the dopant, a gas resulting from decomposition of the gas containing the raw material and/or the dopant and a gas supplied to the solvent together with the gas containing the raw material and/or the dopant.

4. The liquid phase growth method for a silicon

crystal according to Claim 1, wherein the solvent and the raw material and/or the dopant are agitated with a mechanical device.

5. The liquid phase growth method for a silicon crystal according to Claim 1, wherein a solvent comprising a metal is used as the solvent.

6. The liquid phase growth method for a silicon crystal according to Claim 5, wherein the metal comprises at least one selected from the group consisting of In, Sn, Bi, Ga and Sb.

7. The liquid phase growth method for a silicon crystal according to Claim 1, wherein the gas containing the raw material comprises SiH_4.

8. The liquid phase growth method for a silicon crystal according to Claim 1, wherein the gas containing the raw material comprises Si_nH_{2n+2} (where n represents an integer of 2 or more).

9. The liquid phase growth method for a silicon crystal according to Claim 1, wherein the gas containing the raw material comprises a halogenated silane.

10. The liquid phase growth method for a silicon crystal according to Claim 1, wherein the gas containing the dopant comprises at least one selected from the group consisting of PH_3, PF_3, AsH_3, B_2H_6, BF_3, BCl_3, $Ga(CH_3)_3$ and $Ga(C_2H_5)_3$.

11. A manufacturing method for a solar cell including at least a step of forming a silicon layer by liquid phase growth, comprising the step of:

supplying a gas containing a raw material and/or a dopant into a solvent after at least a part of the gas is decomposed by application of energy to the gas.

12. The manufacturing method for a solar cell according to Claim 11, wherein the energy is applied by at least one selected from the group consisting of heat, plasma, a catalyst and light.

13. The manufacturing method for a solar cell according to Claim 11, wherein the solvent and the raw material and/or the dopant are agitated with at least one of the gas containing the raw material and/or the dopant, a gas resulting from decomposition of the gas containing the raw material and/or the dopant and a gas supplied to the solvent

together with the gas containing the raw material and/or the dopant.

14. The manufacturing method for a solar cell according to Claim 11, wherein the solvent and the raw material and/or the dopant are agitated with a mechanical device.

15. The manufacturing method for a solar cell according to Claim 11, wherein a solvent comprising a metal is used as the solvent.

16. The manufacturing method for a solar cell according to Claim 15, wherein the metal comprises at least one selected from the group consisting of In, Sn, Bi, Ga and Sb.

17. The manufacturing method for a solar cell according to Claim 11, wherein the gas containing the raw material comprises SiH_4.

18. The manufacturing method for a solar cell according to Claim 11, wherein the gas containing the raw material comprises Si_nH_{2n+2} (where n represents an integer of 2 or more).

19. The manufacturing method for a solar cell according to Claim 11, wherein the gas containing the raw material comprises a halogenated silane.

20. The manufacturing method for a solar cell according to Claim 11, wherein the gas containing the dopant comprises at least one selected from the group consisting of PH_3, PF_3, AsH_3, B_2H_6, BF_3, BCl_3, $Ga(CH_3)_3$ and $Ga(C_2H_5)_3$.

21. The manufacturing method for a solar cell according to Claim 11, comprising the step of forming an n-type layer after the step of forming the silicon layer by liquid phase growth.

22. The manufacturing method for a solar cell according to Claim 21, wherein the n-type layer is formed by allowing the dopant to diffuse into a part of the silicon layer.

23. A liquid phase growth apparatus for a silicon crystal, comprising:

a device for holding a solvent to dissolve a raw material for silicon;

a device for immersing a substrate in the solvent or

allowing the substrate to contact the solvent;

a device for supplying a gas containing at least a raw material and/or a dopant to the solvent; and

an energy application device upstream to the gas supply device in order to decompose at least a part of the gas containing the raw material and/or the dopant.

24. A liquid phase growth apparatus for a silicon crystal, comprising:

a solvent receiver for holding a solvent to dissolve silicon atoms;

a raw material gas feed pipe having gas blowoff holes in the solvent held in the solvent receiver;

an energy application chamber which is connected to the raw material gas feed pipe and which applies energy to a gas passing through the raw material gas feed pipe outside the solvent receiver;

a wafer cassette which holds substrates and which can be put into the solvent and be pulled out of the solvent held in the solvent receiver at will; and

a heating device for heating the solvent.

25. The liquid phase growth apparatus for a silicon crystal according to Claim 24, further comprising a mechanical agitation device which can be put into the

solvent and be pulled out of the solvent at will.

26. A liquid phase growth apparatus for a silicon crystal, comprising:

a solvent receiver for holding a solvent to dissolve silicon atoms;

a growth vessel for performing liquid phase growth on a substrate;

a pipe for circulating the solvent between the solvent receiver and the growth vessel;

a raw material gas feed pipe having gas blowoff holes in the solvent held in the solvent receiver;

an energy application chamber which is connected to the raw material gas feed pipe and which applies energy to a gas passing through the raw material gas feed pipe outside the solvent receiver;

a wafer cassette which holds substrates and which can be put into the solvent and be pulled out of the solvent held in the solvent receiver at will; and

a heating device for heating the solvent.

27. The liquid phase growth apparatus for a silicon crystal according to Claim 26, further comprising a device for differentiating the temperature of the solvent in the solvent receiver from the temperature of the solvent in the

growth vessel.

28. The liquid phase growth apparatus for a silicon crystal according to Claim 27, wherein the device for differentiating the temperature of the solvent in the solvent receiver from the temperature of the solvent in the growth vessel comprises a heater block surrounding the solvent receiver.

29. The liquid phase growth apparatus for a silicon crystal according to Claim 26, wherein at least a part of the pipe serves as a heat exchanger.

30. A liquid phase growth apparatus for a silicon crystal, comprising:

a solvent receiver for holding a solvent to dissolve silicon atoms;

a pipe for circulating the solvent, the pipe having both ends connected to the solvent receiver and having an opening other than both the ends;

a raw material gas feed pipe having gas blowoff holes in the solvent held in the solvent receiver;

an energy application chamber which is connected to the raw material gas feed pipe and which applies energy to a gas passing through the raw material gas feed pipe outside the

solvent receiver;

a holding component for holding a substrate in order that the substrate is allowed to contact the solvent at the opening; and

a heating device for heating the solvent.

31. The liquid phase growth apparatus for a silicon crystal according to Claim 30, further comprising a device for differentiating the temperature of the solvent in the solvent receiver from the temperature of the solvent in the neighborhood of the opening.

32. The liquid phase growth apparatus for a silicon crystal according to Claim 31, wherein the device for differentiating the temperature of the solvent in the solvent receiver from the temperature of the solvent in the neighborhood of the opening comprises a heater block surrounding the solvent receiver.

33. The liquid phase growth apparatus for a silicon crystal according to Claim 30, wherein at least a part of the pipe serves as a heat exchanger.